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Forthcoming Papers

H. G. Weber, H.-J. Glas, R. Huber, M. Kompitsas, G. Schmidt, and G. zu Putlitz, Erstes Physikalisches Institut, Universität Heidelberg:
Optical Pumping Method for Studying Nuclear-Spin Polarization in Alkali Dimers

Magnetic resonance of ^{133}Cs nuclei was observed in free Cs_2 dimers employing the method of optical pumping in combination with atom-molecule nuclear orientation transfer. This novel method allows measurements of nmr spectra in free diamagnetic molecules, atom-dimer exchange cross sections, dissociative collision cross sections of dimers against buffer gases and intramolecular relaxation. The dimer-atom exchange cross section for $Cs-Cs_2$ is $\sigma_{DE}=(1.9\pm0.4)\cdot10^{-14}\,cm^2$, the dissociative collision shows the expected exponential behaviour in temperature.

W. Tausendfreund, Institut für theoretische Festkörperphysik der Universität des Saarlandes, Saarbrücken:
Der Zugang zur Stark-Leiter über die Boltzmann-Gleichung

We present a new derivation of the Stark ladder in crystals obtained by solution of the Boltzmann equation, neglecting field-induced interband transitions and collisions. We extend the method to include collision processes, and give expressions for the resultant splitting and broadening of the levels. We then apply the results in a calculation of the current which arises from the sudden switching on of an electric field.

H. Hillig, B. Cleff, W. Mehlhorn and W. Schmitz, Institut für Kernphysik der Universität Münster, Germany:
***K* Auger Transitions of the Free Sodium Atom**

The *K* Auger spectrum of the free sodium atom, following electron impact ionization, was measured with 0.16% resolution using a sodium atomic beam as target. The absolute energies and relative intensities of *KLL*, *KLM* and numerous satellite transitions have been determined. The absolute energies of the *KLL* transitions of the free sodium atom were found to be smaller by 13.1 eV than the corresponding energies found for sodium in Na_2O (relative to the Fermi level) by Fahlman *et al.* Also the relative *KLL* intensities differed in two cases indicating solid state and/or chemical effects. The present relative intensities agree better with theoretical values calculated by McGuire, Walters and Bhalla, and Chen and Crasemann than those of Na_2O.
In an appendix the natural line widths of the *KLL* and *KM-LLM* transitions of sodium have been calçulated.

H. J. Fink, J. Maruhn, W. Scheid, and W. Greiner, Institut für Theoretische Physik der Universität Frankfurt am Main, Germany:
Theory of Fragmentation Dynamics in Nucleus-Nucleus Collisions

The fragmentation of a nuclear system is described by a dynamical coordinate, the fragmentation coordinate $\eta=\dfrac{A_1-A_2}{A_1+A_2}$. The total Hamiltonian describing a binary heavy ion encounter includes a part $H(R,\alpha,\eta)$ which describes the fragmentation and its coupling to other degrees of freedom. It is a collective Hamiltonian which is calculated from the microscopic Asymmetric Two-Center Shell Model (ATCSM). The properties of this Hamiltonian are extensively discussed and methods for its solution are described. Formulae for cross sections of specific nuclear fragmentations including fusion are derived.

Mahinder S. Uberoi, Department of Aerospace Engineering Sciences and Joint Institute for Laboratory Astrophysics University of Colorado, Boulder, Colorado,
J. P. Narain, Department of Aerospace Engineering Sciences University of Colorado, Boulder, Colorado:
Generalized Heisenberg Theory of Turbulence

Solutions of the generalized theory are obtained which are consistent with the previous work on energy transfer measurements. They also agree with the measurements of turbulent energy spectrum for wave numbers in the universal equilibrium range.

D. R. Bryant and L. J. Curtis, Department of Physics and Astronomy, University of Toledo, Toledo, Ohio:
A Method for Determining Beam-Foil Excited Hydrogenic Populations from Lyman and Balmer Decay Curves which Exactly Accounts for Cascading

A method is presented which permits the determination of relative initial *p*-state populations and combined *s*- and *d*-state populations of beam-foil excited hydrogenic atoms from Lyman and Balmer decay curves. The method utilizes exact and linear cascade relationships which exist between corresponding portions of these decay curves when they are measured under common excitation conditions, and does not involve exponential curve fitting. The technique determines (but does not require a measurement of) the relative normalizations of the various decay curves by a simple linear regression, thus inferring initial populations from the renormalized relative intensities as extrapolated to the foil position. The basic relationships of the method are developed, and results are presented from a computer study of the quality of data which would be required to extract populations by this technique.

H. M. Hofmann, J. Richert, Max-Planck-Institut für Kernphysik, Heidelberg, Germany,
T. H. Schucan, Schweizerisches Institut für Nuklearforschung Villigen, Switzerland:
Properties of Padé Approximants to the Effective Interaction

Some properties of Padé approximants to effective interactions in nuclei are investigated. The behaviour of higher order approximants is discussed in model calculations. In the case of [2, 1]-approximants a criterion is derived for the occurrence of spurious poles which are not related to level crossings.

H. Grawe, U. Löhle and R. König, Fakultät für Physik der Universität Freiburg (W.-Germany):
The Gamma-Decay of ^{34}Ar

States in ^{34}Ar up to 5.5 MeV excitation energy, populated by the $^{32}S(^3He, n\gamma)$ reaction at 8–12 MeV bombarding energy, have been investigated with the Doppler shift attenuation method, $n\gamma$ angular correlation and $n\gamma\gamma$ triple coincidence measurements. For the states at 2.09, 3.29 and 4.52 MeV the life-times 200 ± 60 fs, 130 ± 60 fs and 260 ± 80 fs have been found, respectively. The $n\gamma$ correlations yielded the spin assignments $J^\pi=(2^+)$ for the level at 4.13 MeV and $J^\pi=3^-$ for the 4.52 MeV state, and the mixing ratios

$\delta(3.29\rightarrow2.09)=-0.12\pm0.05$ and $\delta(4.13\rightarrow3.29)=-0.52\pm0.15$.

The results are compared with shell model calculations and predictions from the weak coupling unified model.

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$\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \vartheta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \varphi, \phi, \chi, \psi, \omega$

green = Script:
$\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{J}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{S}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}$
$a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z$

blue = Gothic:
$\mathfrak{A}, \mathfrak{B}, \mathfrak{C}, \mathfrak{D}, \mathfrak{E}, \mathfrak{F}, \mathfrak{G}, \mathfrak{H}, \mathfrak{I}, \mathfrak{J}, \mathfrak{K}, \mathfrak{L}, \mathfrak{M}, \mathfrak{N}, \mathfrak{O}, \mathfrak{P}, \mathfrak{Q}, \mathfrak{R}, \mathfrak{S}, \mathfrak{T}, \mathfrak{U}, \mathfrak{V}, \mathfrak{W}, \mathfrak{X}, \mathfrak{Y}, \mathfrak{Z}$
$\mathfrak{a}, \mathfrak{b}, \mathfrak{c}, \mathfrak{d}, \mathfrak{e}, \mathfrak{f}, \mathfrak{g}, \mathfrak{h}, \mathfrak{i}, \mathfrak{j}, \mathfrak{k}, \mathfrak{l}, \mathfrak{m}, \mathfrak{n}, \mathfrak{o}, \mathfrak{p}, \mathfrak{q}, \mathfrak{r}, \mathfrak{s}, \mathfrak{t}, \mathfrak{u}, \mathfrak{v}, \mathfrak{w}, \mathfrak{x}, \mathfrak{y}, \mathfrak{z}$

violet: the small letter *l* and the capital letter *O* (to distinguish them from the numeral 1 and zero)

It will help the printer if in doubtful cases the position of subscripts and superscripts is marked in the following way:
$b_{\hat{l}}^{\hat{}}, a_{\check{\nu}}^{i}$.

The following symbols are frequently confused:
$\cup, \mathbf{\cup}, \bigcup$; $o, O, 0$; $\mathrm{x}, x, X, \varkappa$; v, v, ν; $\phi, \varphi, \Phi, \varnothing$; $l, 1$; $\varepsilon, \in, \Subset$;
also the handwritten Roman letters:
c, C; k, K; o, O; p, P; s, S; u, U; v, V; w, W; x, X; z, Z; e, l;
the symbol a and the indefinite article a:
Please take care to distinguish them in some way.

Notations

preferred form	instead of	preferred form	instead of
$\exp(-(x^2+y^2)/a^2)$	$e^{-\frac{x^2+y^2}{a^2}}$	$\dfrac{\cos(1/x)}{(a+b/x)^{1/2}}$	$\dfrac{\cos\frac{1}{x}}{\sqrt{a+\frac{b}{x}}}$
$7/8, (a+b)/c$	$\frac{7}{8}, \frac{a+b}{c}$	f^{-1}	$\bar{f}^{1}$

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